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# ROADMAP TOWARDS WATER RESOURCE MANAGEMENT PLANNING IN GEORGIA

INITIAL FINDINGS

GOVERNING FOR GROWTH (G4G) IN GEORGIA

31 July 2015

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# DATA

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## ACRONYMS

<b>G4G</b>	Governing for Growth in Georgia
<b>USAID</b>	United States Agency for International Development
<b>ADB</b>	Asian Development Bank
<b>DSS</b>	Decision Support System
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EIA</b>	Environmental Impact Assessment
<b>EIB</b>	European Investment Bank
<b>EPIRB</b>	Environmental Protection of International River Basins
<b>EU</b>	European Union
<b>GoG</b>	Government of Georgia
<b>GSM</b>	Global System for Mobile Communications
<b>HPP</b>	Hydro Power Plant
<b>ICRC</b>	International Committee of Red Cross
<b>IDP</b>	Internally Displaces Person
<b>IFAD</b>	International Fund for Agricultural Development
<b>IFC</b>	International Finance Corporation
<b>MENRP</b>	Ministry of Environment and Natural Resources Protection of Georgia
<b>NEA</b>	National Environmental Agency
<b>REC</b>	Regional Environmental Center
<b>RBWMP</b>	River Basin Water Management Plan
<b>UWSCG</b>	United Water Supply Company of Georgia
<b>WB</b>	World Bank
<b>WFD</b>	Water Frame Directive

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# INTRODUCTION

The USAID Growing for Growth (G4G) project is focused on development of enabling environment for economic growth primarily through public-private dialogue on a number of economic policy issues. One of those policy issues is the determination of a process for water allocation between various competing interests including, among others, potable water consumers, irrigation water users and hydropower plants. Under Component 3 of G4G, USAID is developing a process to be used by the Government of Georgia (GoG) in developing a water resource management plan for river basin that will analyze the future water balance for each river basin and a water allocation for competing water consumers and user.

G4G is currently developing an initial river basin water resource management (WRM) plan for the Aragvi River Basin. The initial river basin plan will include:

- Estimated historical water balance – supply, demand and water losses;
- Estimated ecological flow under the proposed Water Law;
- Projected investment (2015-2020) for water supply resources;
- Forecasted demand growth (2015-2030);
- Estimated forecasted water balance (2015-2030);
- Identified water supply shortfalls, if any during the forecast period;
- Identification of data gaps and the investment requirements for measuring and monitoring equipment in the Aragvi River Basin.

It should be noted that the above WRM plan will not include water quality issues that are normally found in a WRM plan, except that minimum ecological flows will be estimated. The EU WRM implementing firm is considering cooperation with G4G to expand the initial WRM developed by G4G to include water quality issues.

The report provides a preliminary analysis and recommendations (roadmap) to describe how the initial river basin planning process developed for the Aragvi River Basin can be used by the GoG as a template for developing river basin plans for the rest of Georgia.

# BACKGROUND

Georgia is facing unprecedented challenges with the management of its water resources due to a number of concurrent factors. Following the collapse of the Soviet Union, infrastructures for potable water management, irrigation and drainage, and the national network of hydro meteorological stations for water monitoring and control have been left to decay. The lack of a robust system for collection, storage and analysis of hydro and meteorological data is the greatest gap that the sector is facing and it needs to be filled in order to enable an evidence-based decision making process for fair and transparent allocation of the water resources.

In absence of an analytical capacity, the debate about the water use and its regulation remains a battle of principles that brings to the radicalization of the different positions around sensitive topics, such as the reintroduction of permits for water use and the reform of water sector tariffs structures. In addition, the lack of hydro-meteorological data and water modelling capacity results in uncontrolled urban development and inadequate land management, with increased disruptive impact and recurrence of flood events.

Data monitoring history started sometime in the 1800, but it became relatively reliable only under Stalin. During the Soviet time the hydrologic monitoring system was quite extensive and the list of parameters monitored was quite long. In the '80s, the country had a network of about 130 hydrological and 180 meteorological stations. In the '90s, the system collapsed, and only since the 2000, with the support of multilateral and bilateral donors, Georgia was able to gradually start rebuilding the network with modern equipment. The governments of Finland, Canada and the Czech Republic are among the biggest supporters. At present 41 hydrological stations are operational, 24 of which are automated with GSM capacity. As part of this effort, with the support of the Norwegian government, the Georgian National Environmental Agency (NEA) have digitalized about the 70% of the historic hydrological data available from the Soviet time in order to be able to use the data for basic calculation and modelling of the water supply resources.

Similarly to the monitoring network, the irrigation infrastructures decayed after the collapse of the Soviet Union and extensive rehabilitation programs are in progress with funds from IFAD, World Bank and the Dutch government. Water losses in the old irrigation systems are above 50%.

In this context, one of the Government of Georgia's main priority is to create favorable conditions for private investments in hydropower generation and decrease dependency on Russian energy imports. As a matter of fact, a solid planning capacity in water resources management and allocation is the pre-condition for a sustainable use of the resources and, as a consequence, to ensure the institutional and environmental stability needed to attract private investments in the sector.

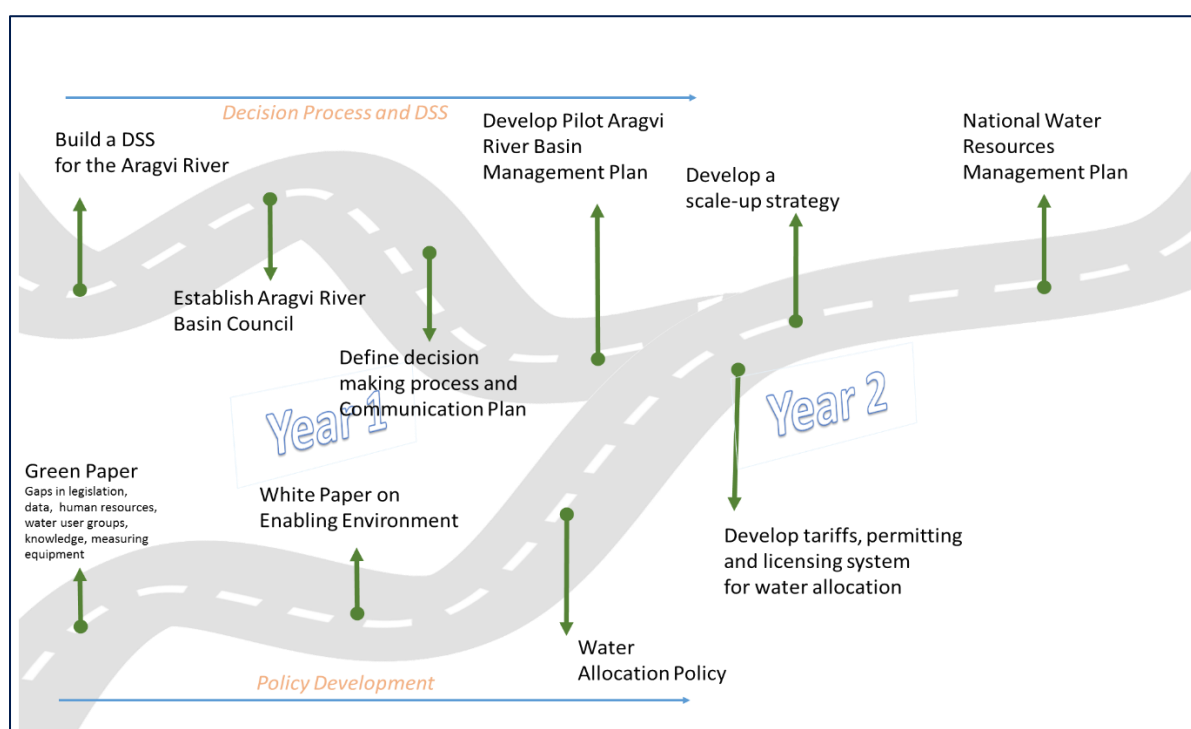
This following Roadmap identifies the steps that are needed to enable decisions from a river basin level to a national level, and it takes into consideration the existing approximation process of Georgia towards the European Union. It therefore refers to the River Basin as the administrative unit for the water management.

# ROADMAP FOR DEVELOPING NATIONAL WRM PLANNING CAPACITY

The following roadmap identifies the nine (9) basic steps for the enabling of an evidence-based decision making process towards a national water resources management planning capacity (Figure 1). As illustrated below, the steps are distributed along two main converging paths which are described in detail later in this report:

1. The development of a Decision Support System (DSS) to support the related Decision-Making Process;
2. The development of relevant policies for water allocation, permitting and tariff systems.

**Figure 1** – Roadmap to Develop National WRM Planning Capacity



The two paths are strictly correlated, and the failure of completing one of the two processes will diminish/negate the efforts put into the other path. The Ministry of Environment is quite advanced in the development of the legislation for the approximation to the European Framework Directive: the draft of the Law for Water Resources Management is at its second round of consultations at ministry level, and a number of by-laws already are drafted and are ready to be formalized upon approval of the main law.

The development of the regulatory and legislative framework is therefore ahead of the actual capacity of the country to make educated decisions about water allocation. As a consequence, the permitting system (abolished in the past and reintroduced by the new law) is likely to remain ineffective for many years until the country will gain the capacity to establish objective criteria based on the availability and sustainable use of the resource. The

**permitting system** is, indeed, meant to control abstraction and discharge in order to ensure an equitable distribution of the resource and to protect the environment. Inadequate capacity for monitoring water resources will prevent the permitting system from being able to fulfill its intended function.

# DEVELOPMENT OF A DECISION SUPPORT SYSTEM TO SUPPORT DECISION MAKING PROCESSES

## DECISION SUPPORT SYSTEM FOR THE SELECTED PILOT RIVER BASIN (ARAGVI)

The base of all decisions about the use and fair allocation of water resources relies on hydrological and meteorological data that inform decision-makers about the available quantity of the resource in a certain river basin. For this reason, the creation of a Decision Support System (DSS) based on hydrological data is the first step to build evidence based decision-making process.

The Aragvi River Basin was chosen for the implementation of development of an initial River Basin Water Management Plan (RBWMP). A study on the Water Balance of the River Basin is planned as part of the activities of G4G: the findings of the study will feed the discussions related to water allocation and will contribute to the development of the RBWMP.

According to the findings at the time of this report, two (2) automatic and one (1) non-automatic hydrologic stations are in place along the river. Based on the area covered by the Aragvi River Basin (2,724 square kilometers or 1,052 square miles), five (5) more hydrologic stations need to be installed to enable the National Environmental Agency (NEA) to start building a robust database sufficient to monitor the water resources of the basin.

There are various technological options to explore, from the cheapest open source system (\$1,000 to \$2,000 per hydro station such as ACRONET) to proprietary technologies (around \$12,000-\$15,000 per station). Each solution has pro and cons but both solutions require specific training on software for data analysis and database management.

Solutions need to be discussed more in detail with the NEA.

With a basic hydro-meteorological network in place, in light of the disruptive and recurrent flood events that affect the country, training on water modelling and related software may be added to the capacity building activities, although a topographic work or Lidar survey of the most affected areas should accompany the work to build a flood risk management system.

## ESTABLISHING THE ARAGVI RIVER BASIN COUNCIL

In line with the European Union (EU) Water Framework Directive (WFD), the river basin is chosen as the natural geographical and hydrological unit and single system of water management.

In cooperation with the Ministry of Environment, G4G will support the Ministry's Water Management Service to direct the strategic planning effort and drive the Water Resource Management Planning effort through all stages of the preparation, to ensure that the initiative realizes maximum benefit. Details of the institutional arrangement to lead the water resources management policy will be defined within the WRM White Paper (see page 11 "Green Paper and White Paper").

The structure of River Basin Councils has been already defined but it is pending the approval of the main law for Water Management to be formalized. G4G will support the Water Management Service to initiate the river basin council for the Aragvi River. Frequency of meetings, activities, and commitment from all participating stakeholders will be discussed during the preparatory meetings.

G4G will ensure that the activities of the River Basin Council will be in line with the Water Management Service expectations, while supporting the creation of the State Committee at national level that will be involved in decisions about water resources protection and its sustainable use.

## **DEVELOPING A TRANSPARENT DECISION MAKING PROCESS AND ITS RELATED COMMUNICATION PLAN**

While the creation of a Decision Support System is the first step to enable decisions about the use of water, clarity and transparency on the actual decision-making process is fundamental for anticipating conflicts and finding best solutions.

The River Basin Council requires transparent and accurate information for weighing options and for discussing appropriate solutions. Capacity strengthening is needed for the visualization of raw data in a clear and easy to read format, in order to illustrate information such as the comparison between the annual hydro-meteorological profile with the restriction of water demand along the same period of time, highlighting potential conflicts (times of the year where the demand exceeds the available quantity).

Solutions may entail the upgrade of the existing infrastructures or the need of new ones, or they may reveal that a simple coordination between competing users could help resolving existing conflicts. In some cases, a compensation system between users can be a temporary solution while working on a more sustainable option. The compensation system is present in the draft of the WRM law under discussion and will require the development of a national policy to set the main principles of the negotiation mechanisms. Nevertheless, in absence of a specific policy, direct negotiation among actors can be quite effective in reaching agreements about the use of the resource while compensating each other losses.

The decision-making process has double benefits: on one side it serves the purpose of identifying long-term interventions for final solutions to existing conflicts, while on the other it facilitates water allocation decisions based on the existing situation.

Every year the impact of the decisions reached by the River Basin Council, whether by consensus or through negotiations, will need to be assessed: the evaluation should focus on the overall benefit of the solutions adopted, including:

- the economic benefit for the residents of the river basin;
- changes in productivity and employment rate of the area;
- improvement of environmental standards;
- and so forth.

The evaluation of the impact may be needed on a yearly basis for the first few years, until the River Basin Council reaches a thorough understanding of the most efficient use of the resource, based on specific indicators that will be developed and weighed along the process.

Nevertheless, in case of extreme events (prolonged draught or excess of precipitations) the role of the River Basin Council is to ensure appropriate and effective coordination among the stakeholders to maximize the benefits and minimize damages.

The River Basin Council should also play a role in case of new urban development plans or construction of new infrastructures, especially roads that can significantly impact the hydrological system. A water modelling capacity should be acquired by the Decision Support System, in order to provide sufficient understanding of the possible impact of new development and anticipate potential issues at the design stage, when is still possible to discuss options and identify solutions. (G4G is analyzing the various WRM models through a Grant.)

A Communication Plan is the key tool for an effective Decision-Making Process and needs to be developed as soon as the River Basin Council is formed. The Communication Plan incorporates the following principles:

- **Transparency:** the communication must be transparent and factual correct at all time, and for this reason needs to be public, possibly hosted by the Environmental Information and Education Center of the Ministry of Environment and Natural Resources Protection.
- **Relevance:** the communication needs to be relevant for its recipients. Unnecessary communication will bring to loss of attention and eventually interest.
- **Effectiveness:** the right level and amount of information has to be delivered to stakeholders based on their level of interest and involvement in the decision-making process (e.g. farmers may be interested in knowing the quantity and timing of the distribution of the resource along the year, representatives of civil society organization may be concerned by the impact on the environment and the overall quality of the resource, householders by its availability and quality for personal use).
- **Clarity:** information needs to be clear and understandable to the target audience. Complicated hydro-meteorological data as well as economic analysis need to be communicated in simple terms to non-technical stakeholders such as householders and farmers in order to empower their active participation to the public debate about the use of the resource.

The Communication Plan will outline the main lines of communication between different stakeholders at local level as well as with the national level. Particularly important will be the communication with the State Committee that is planned to be created with the approval of the law on water resources management and will monitor the alignment of local decision with national guidelines. A template of the Communication Plan will be developed with the support of the Water Management Service. The template will need to be made available and accessible on the Environmental Information and Education Center website. The template should leave flexibility in order to be adapted to the specific circumstances of each river basin.

## ARAGVI RIVER BASIN WATER MANAGEMENT PLAN

The Aragvi River Basin has been chosen as for the development of an initial River Basin Water Management Plan (RBWMP) due to its importance and high potential of conflict for water use between different actors. In the Aragvi River, water is intensely exploited for

energy and agricultural production and civil use simultaneously, providing drinking water to most of Tbilisi.

The plan will be informed by the Decision Support System and will reflect at all time the existing capacity of such system. The most important achievement expected by the pilot RBWMP is the set-up of a decision-making process at River Basin scale that is easily replicable and adaptable across the country. The Aragvi RBWMP will be a living document and will require some iteration and several years before reaching a consolidated evidence-based process. Nevertheless, by the end of the first year, the structure of the plan with its main components and first set of resolutions will be in place. It will be the responsibility of the River Basin Council to establish a timeline for review and update of the plan based on the needs and changes in the context.

The Plan should be organized in separate sections for short, medium and long-term objectives with different frequency of the respective reviewing processes, from more to less frequent. The timeline for these processes need to be identified at River Basin level and adapted to the specific circumstances.

The Aragvi RBWMP is not the first attempt for the country to develop a RBWMP and will draw lessons from the recent experience of the Chorokhi-Adjaristskali River Basin Management Plan, building up on the lessons learnt from the EU's Environmental Protection of International River Basins Project.

## **DEVELOP A SCALE-UP STRATEGY FOR RBWMP**

As important as the Plan itself is the development of a scale-up strategy drawn from the experience with the Aragvi RBWMP and in collaboration with the Ministry of Environment and Natural Resources Protection. For the purpose of this roadmap, the scale-up strategy will focus on validating the methodology used for the Aragvi and develop a Resources Mobilization Plan to ensure financial sustainability and long-term support for Water Resources Management activities. The strategy will be developing criteria to prioritize the following steps and outline the timeline for their implementation.

# **POLICY DEVELOPMENT**

## **GREEN PAPER AND WHITE PAPER ON WATER ALLOCATION IN GEORGIA**

Both the Green Paper and White Paper are already planned as part of the G4G project and are mentioned here to illustrate the connection with other activities.

The purpose of the Green Paper is to carry out a Sectorial Gap Analysis in order to orient the following discussion on the full water sector policy that will be captured by the White Paper document. The Green Paper should be finalized by the end of September 2015 and its findings will also orient the work for the Aragvi RBWMP. Similarly, the discussion on the overall policy for the development of the White Paper will accompany the structuring of the River Basin Council for the Aragvi River Basin, while at the same time the work on the Aragvi RBWMP will provide evidence that will feed the discussion around the policy.

The two parallel processes within the Roadmap need to be carried out under the umbrella of the Ministry of Environment and Natural Resources Protection in order to ensure the overall legitimacy and consistency of the discussions and solutions adopted.

## **WATER ALLOCATION POLICY**

The water allocation policy will be developed as part of the White Paper. The important thing to bear in mind is that the government should set clear guidance about the water use and its principles. The water allocation policy takes into consideration the satisfaction of basic needs (water for personal use), environmental issues, productivity needs and recreational use.

The allocation policy states the principles that will guide the development of the allocation plans at River Basin level, outlining priority, as well as the main regulatory environment for each use (tariffs, permitting or licensing). As we mentioned earlier, in order to be able to develop a water allocation plan, both a clear policy and the understanding of the balance between availability and demand need to be in place in order to reach sensible decisions about the use of the resource.

## **TARIFFS, PERMITTING AND LICENSING SCHEME**

The tariff structure, as well as the criteria for the attribution of water permits and licensing, will require a deep understanding of the value of the resource specific to the river basin. There are no obvious methodologies to establish the value of a liter of water. A combination of factors such as the cost of the infrastructures for water abstraction, distribution, treatment and discharge, the availability of the resource, environmental constraints, demographic distribution, industrial and agricultural activities, recreational use, cost opportunity and willingness to pay come together when designing the tools that will regulate the use of the resource.

The G4G project is in the process of developing a study specific to the Aragvi River: The study will help identify the major factors that compose the water demand at river basin level and its related water balance, and therefore the actors that would be more affected by an increase of the tariffs or a restriction of the permitting policy. The initial findings will help identify the main stakeholders to be involved in the River Basin Council.

Rather than trying to estimate the exact price that users would be willing to pay for the liter of water, the aim of this step is to build a system that allows some level of flexibility for decisions and negotiations between competing users. Besides the development of a proposed Tariff, Permitting and Licensing scheme, a compensation mechanism at the River Basin Council level will be proposed in order to allow this flexibility within a controlled environment. Bearing in mind that the highest level of transparency is vital to ensure a fair and equitable distribution of the resource across all users, all decisions and negotiations about the water use must be public and easily accessible.

With time passing, more data will be available and will gradually enable more in depth analysis of the impact of water allocation on productivity, employment, health, and environment. It is therefore important to progressively build the capacity to capture information about the impact of water allocation decisions in order to adjust policies and practices towards the best use of the resource.

# ROADMAP TOWARDS A NATIONAL WATER RESOURCES MANAGEMENT PLAN

The initial development of the Aragvi RBWMP and the specific policies developed along this Roadmap will contribute to the objective of building one national policy on water resources management.

The need of consolidating the national policy on water resources management in one place is particularly important in a context such as the one in Georgia, where the absence of one specific institution in charge of the whole sector creates uncertainty about the right of access and lack of comprehensive understanding of the present use and distribution of the resource. At present, a number of Ministries share the responsibility for the protection of water bodies and regulation about its use, depending on the location of the water body, its characteristics and the intended use. As a result, existing rules are not easy to follow or to enforce.

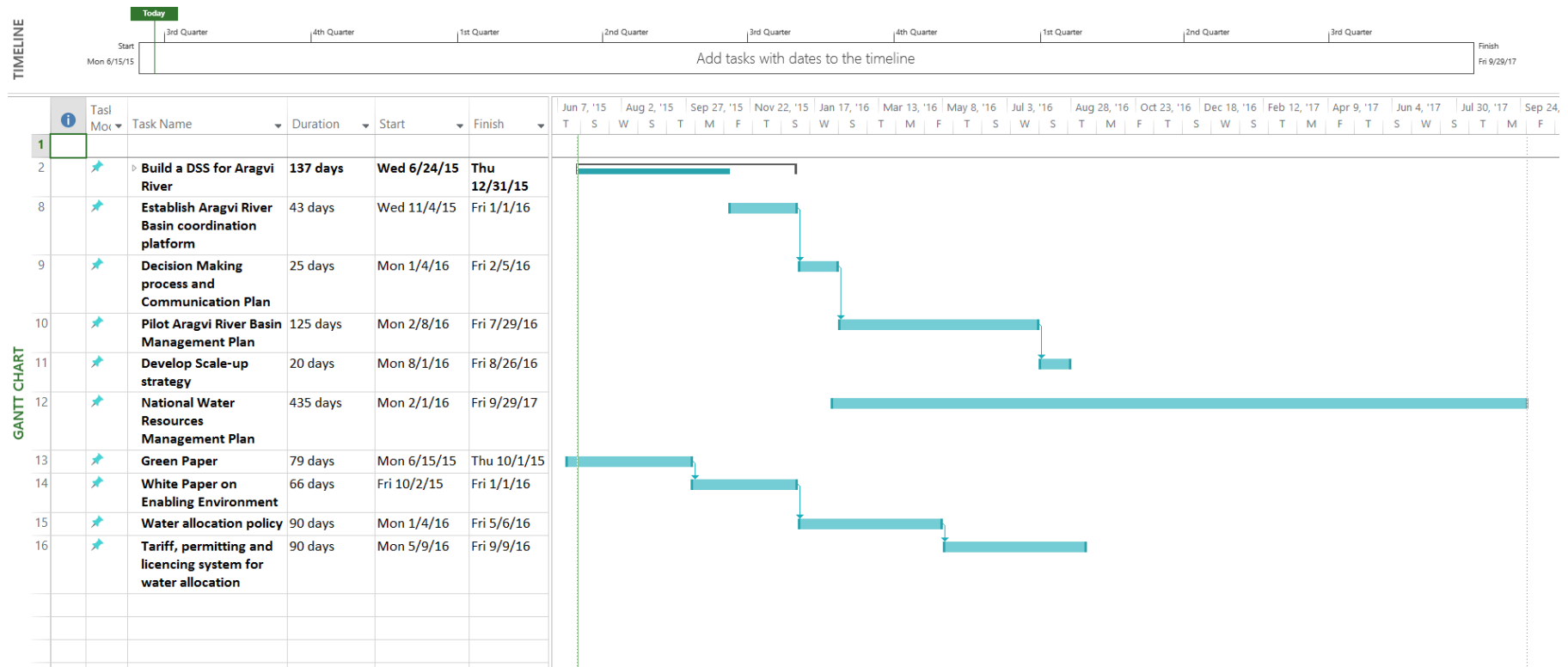
A comprehensive policy for Water Resources Management is especially important for Georgia in order to create a favorable environment for long-term investments in hydropower generation, ensuring a sustainable and yet profitable use of its water resources.

A comprehensive policy would also help framing the discussion about specific issues such flood risk management and environmental protection at the more technical and pragmatic level, with a focus on the solutions rather than on the conflicts.

The process for the development of a National Water Resources Management Plan can take several years before coming to an end. The aim of the Roadmap over the coming two years is to build consensus on the need for one, to support the Water Management Service to structure and initiate the process, while building up on the experience of the initial Aragvi RBWMP.

# APPENDICES

## OUTLINE OF THE WORKPLAN



## INITIAL FINDINGS

A list of meetings with the summary of the discussions and early findings is reported below.

Meeting/Activity	Met with	Date	Time	Summary
<i>Ministry of Energy</i>	Giorgi Shukakidze – Deputy head of energy department, Ministry of Energy	June 2, 2015	11.00am	<p>The national energy demand grows an average of 5% per year. In order to respond to the demand growth and at the same time reach and maintain energetic independence from Russia, there is a big effort in expanding the hydro power production in Georgia.</p> <p>76 are the projects currently approved and 91 are identified as potential sites for new HPPs, for a total of 40 to 50 rivers affected.</p> <p>4 new projects (Neskra, Namakhvani, Oni and Khudoni hydro power plants (HPPs)) are in the pipeline for the improvement of water storage capacity (reservoirs) to increase energy storage for about 1.7GW in order to satisfy peak of demand. Hydrological data belong to Hydromet: it includes elevation and in some case sediment level and chemical contamination.</p>
<i>GAMMA Consulting</i>		June 2, 2015	2.00pm	<p>For the selection of the Pilot River Basin for the evaluation of the water balance, GAMMA adopted a Decision Support Software developed by Helsinki University. The choice was for the Aragvi River as best candidate according to the criteria adopted. The criteria included some weighting of indicators that was defined by experts' discussions. Some steps of the methodology remains therefore based on experts' judgements.</p>

<i>Ministry of Environment and Natural Resources Protection - Agency of Protected Areas (APA)</i>	Dimitry Beridze – Deputy Head of Agency of Protected Areas, MENRP	June 4, 2015	1.00pm	The Agency for Protected Areas believes that the law on Water Resources Management will not affect them much, although protection of water resources of special importance is one of the most important part of their work. They work a lot on the communication side, especially when protected areas are inhabited by pre-existing settlements. The use of water in protected areas with strategic economic interest is not completely forbidden: for example in Borjomi, HPPs are allowed to abstract the 80% of the resource for power production. Rangers monitor the compliance and enforce the regulation.
<i>Ministry of Environment and Natural Resources Protection - Environmental Information and Education Centre</i>	Ia Papiashvili – Director of Environmental Information and Education Centre, MENRP / Natalia Sultanishvili – Information Division Head at the Environmental Information and Education Centre, MENRP	June 4, 2015	11.00am	The Environmental Information and Education Center of the Ministry of Environment has the mandate to serve as a public information platform: they can serve as hub for relevant information related to RBWMPs and to guarantee transparency of the decision making process. The center was established 2 years ago to allow participation of Civil Society and disclosure of public information to increase transparency. The website has been recently launched and is accessible. They are now developing the structure of a database to host all relevant data and information. They would like support from the G4G project for trainings that can be identified more specifically after the approval of the law on Water Management. There is particular attention from the government for Green Economy and they are looking at how to incorporate this component in their activities.
<i>UNDP project “Reducing Transboundary Degradation in the Kura Ara(k)s “</i>	Tamar Gugushvili	June 4, 2015	12.00pm	The decentralization process and creation of basin authorities is seen as the main challenge. The law is only the starting point: the Water Management Service will need technological and human resources and specific equipment in order to be able to cope with their mandate and to enforce the regulations. The monitoring capacity of water quality is very limited but it is improving, especially on bio monitoring. Standards still need to be defined. At present, the permitting system is related to the Environment as a whole and it is based on EIA. When an activity does not require permits, the existing Technical Regulation applies, that regulates discharge and abstraction standards. The water permit is one of

				the most sensitive issue that the new law is about to re-introduce. The present fees for water use are far too small.
<i>Ministry of Environment and Natural Resources Protection - Water Management Service</i>	Nino Gvazava – head of the water management service, MENRP / Mariam Makarova – deputy head of the water management service, MENRP	June 4, 2015	4.00pm	The institutional setup for water permits will have 2 levels: local and national. A state committee will be involved on decision about water resources protection and their sustainable use. Decision at local level will have to be aligned to the national guidelines. 5 secondary legislation are ready to be approved as soon as the main law will be: - Identification of river basins, - Composition of River Basin Councils, - Monitoring system, - Discharging, - Guidelines for development of RBWMP. To go around the roadblock of the permitting issue, the Ministry of Environment agreed with the Ministry of Agriculture that legislation about permitting and licenses for water abstraction will be enforced only starting 2021: this is to allow the Ministry of Agriculture to rehabilitate its infrastructures.
<i>USAID - New Economic Opportunities (NEO) Initiative</i>	Maia Nizharadze - Local Economic Development Team Leader, USAID New Economic Opportunities (NEO) Initiative	June 5, 2015	11.00am	NEO project - The project focuses on the Internally Displaced Persons (IDPs) as a consequence of the occupation of the Russian army. As part of the project there is a water access component. Problems, related to water access and quality, are mostly located in Eastern Georgia. Their water systems serve about 100 households each. When they build or rehabilitate one, they establish water committees for the maintenance of the infrastructures. Municipalities normally own the infrastructures. Only in one case they work directly with United Water Supply Company of Georgia UWSCG. Municipalities normally do not have the capacities to manage the infrastructures, whereas UWSC does, but is not willing to take responsibilities for additional water infrastructures. Some of the wells that they use to supply water to IDPs have biological contamination. The International Committee of the Red Cross (ICRC) has extensively worked on water supply infrastructures for IDPs.
<i>Ministry of Agriculture</i>	Valerian Mtchedlidze– Head of Amelioration Policy and land	June 5, 2015	2.00pm	The Ministry of Agriculture has a plan to rehabilitate irrigation infrastructures to re-establish the capacity of gravity irrigation systems prior Soviet Union collapse that was about 300,000 Ha of irrigated land. The plan includes the partial rehabilitation of pumping irrigation systems

	management department, at the Ministry of Agriculture			(10,000 Ha) and 100,000 Ha of drainage system by 2021. At present, from 25.000 Ha in 2012, the irrigation capacity already reached 88.000 Ha. Funds come from Government, IFAD, WB and Dutch Aid. More than 60 projects have already been awarded for the rehabilitation of the irrigation system. According to Mr. Mtchedlidze, the river Khrami is the most problematic where there is a real conflict between irrigation and HPP. Water losses are above the 50% in the old irrigation systems. The Ministry of Agriculture sees the reintroduction of the permitting system possible only after the River Basin Council is in place and has technical and technological capacity to monitor and control the water resources.
<i>The Regional Environmental Centre for Caucasus</i>	Sophiko Akhobadze - Director REC Caucasus	June 10, 2015	11.00am	<p>The Regional Environmental Centre for Caucasus (REC) is in charge of the development of the Green Paper that should contain gaps and challenges in policy that need to be addressed by the White Paper. It will consider various case studies, including some from Eastern European countries that have systems similar to Georgia.</p> <p>As per the implementation of the new law for Water Management under discussion, there is a need for a Resources Mobilization Plan. There is no visibility at present on the resources available, whereas the access to the EU funds seems to be complicated in the absence of a dedicated country program. There is a problem of miscommunication between the GoG / Ministry of Environment and the EU about this matter: the difficulty of Georgia to fully benefit from regional projects has been taken from the EU as a lack of interest of the country to access the European Funds.</p>
<i>Environmental protection of international river basins (EPIRB)</i>	Zurab Jincharadze – Deputy team leader at environmental protection of international river basins (EU funded	June 10, 2015	4.00pm	The Environmental Protection of International River Basins (EPIRB) is a regional project that covers 6 countries. In Georgia, it developed the River Basin Water Management Plan for the Choroki River. It adopts a new methodology, combining biology and hydro morphology. They installed 4 new automatic Hydromet stations in the river basin and they foresee that the EU will spend 1M Euro for the purchase of new equipment for Georgia in 2016: more information needs to be collected to avoid overlapping between different initiatives. There will be a new EU project

	project)			to support legislation and policy: Terms of Reference will be ready by this coming Autumn and the project should start by October 2016. Mr. Jincharadze stated that they are willing to cooperate with G4G on the Aragvi River Basin Water Management Plan. The EPIRP worked already on the development of secondary legislation (by-laws) - copy of which was shared just after the meeting. The Ministry of Environment likes the RBWMP developed for Choroki: the methodology is available online.
<i>Georgian Water and Power</i>	Giorgi Tskhadadze + Giorgi Vakhtangishvili - Chief Financial officer, GWP + Guram Akhvlediani – Head of Investment Planning and Project Management + Irakli Babukhadia	June 11, 2015	11.00am	It was the first time they heard about the water law under discussion. After having shown some lack of interest, they eventually understood that the Water Management Plan for the Aragvi river could impact their business, so they confirmed their interest in participating to the dialogue with other stakeholders and being involved in the development of the Aragvi RBWMP.
<i>Amelioration of Georgia</i>	Nikoloz Abuashvili - Advisor to Director, Georgian Amelioration	June 11, 2015	3.00pm	According to Mr. Abuashvili, tariffs for potable water supply and irrigation should be regulated by two different and independent regulatory bodies. The tariff mechanism for irrigation that will soon be adopted by the new law has already been informally accepted. The World Bank is supporting the strategy for Irrigation Sector. Amelioration of Georgia's core business is the "transportation" of the resource They expect the first audit in 2017: by then the new tariff system should be finalized and in place. Amelioration of Georgia has the objective of full cost recovery, as per the EU WFD: it is a challenging objective due to the small size of the farmers' lands that are scattered over a large area and have no economy of scale. A system of vouchers may be adopted to solve the issue of collecting fees. They also face problems due to the land registration issue: only about 30% of the owners have registered their land in the new digitalized

				form, and therefore there is no clear accountability on who is responsible for finalizing the registration effort. Non-revenue water is very high and Amelioration of Georgia is planning to bill the GoG for those areas that do not have proper registration of land and therefore do not pay for the water that they receive.
<i>National Environmental Agency - Hydromet</i>	Ramaz Chitanava – Head of the Hydromet, NEA	June 11, 2015	4.00pm	<p>Data monitoring history started sometime in the 1800, but it became relatively reliable only under Stalin. During the Soviet time the hydrologic monitoring system was quite extensive and the list of parameters monitored was quite long. In the '80 the country had a network of about 130 hydrological and 180 meteorological stations. In the '90 the system collapsed, and only since the 2000, with the support of multilateral and bilateral donors, Georgia was able to gradually start rebuilding the network with modern equipment. Finland, Canada and Check Republic are among the biggest supporters. At present 41 hydrological stations are operational, 24 of which are automated with GSM capacity. As part of this effort, with the support of the Norwegian government, the National Environmental Agency (NEA) have digitalized about the 70% of the historic data available from the Soviet time in order to be able to use them for basic calculation and modelling of the water resources.</p> <p>The Check Hydro-meteorological institute provided Hydromet with a software for hydrologic data monitoring (WINZPV) and related training. They have 2 servers: one online that receives data from automatic stations, the other one offline to store data. At present they have 41 stations, 24 of which are automatic with GSM capacity, some newly installed. They have 2 different kinds: hydrometers and radar stations. The automatic stations only measure the level of the water. For the measure of the water flow they have to go on field missions: theoretically they would need at least 20 missions/year in order to have accurate information, but they are only able to do 5 at the moment, due to limited resources. The error between the automatic data and the direct measurements is not large, but the network is still too small to ensure</p>

				<p>acceptable accuracy: they need to increase the number of observation points. A large Climate Adaptation Fund project is ongoing, focusing on Rioni River. The Norwegians have supported the digitalization of the 70 % of historic data available; the project ended in April 2015. Mr. Chitanava identifies 3 main needs:</p> <ul style="list-style-type: none"> <li>- Extension of the network of hydrological stations,</li> <li>- Increase of manpower and additional resources for both, in-situ measurement and validation of data (5 permanent staff) and for the digitalization of the remaining 30% of historical data (5 people for 1 year);</li> <li>- Training on water and flood modelling software.</li> </ul> <p>In addition to this, in order to add meteorological capacity to their system, they would need a higher performance computer to handle data (beside a network of high tech hydro-meteorological stations). An ongoing regional project is developing a satellite system for flood risk management (monitoring and forecast) but they do not know much about it. At the moment they have 65 meteorological stations in the country, 5 of which in the Aragvi River Basin. At present they can provide us with a rough estimate of the water balance for the Aragvi River, although mostly based on historical data.</p>
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<i>United Water Supply Company of Georgia</i>	Ucha Dzimistarishvili - Head of investments project department, Georgian United Supply Company	June 12, 2015	4.00pm	United Water Supply Company of Georgia is a public communal company (Ltd. 100% state owned). They pay fees for abstraction that are not being raised in a long time due to the political sensitivity of the issue and the fear that this will bring to a raise in the cost of living for households. As a consequence they do not make enough profit to be able to reinvest in their assets. Most capital investments in their infrastructures come from the International Finance Corporation (IFC) and directly from the Government via loans - They are supported by the Asian Development Bank (ADB) (\$500M loan), European Investment Bank (EIB) (80M Euro on existing projects, 100M Euro planned) and the EU. As part of this support, they are building also treatment plants and building or rehabilitating distribution and sewage systems. Company tariffs approved by an independent regulatory commission: the tariff methodology is public and accessible. Every year they submit technical reports to the GNERC, but they do not have a complete metering system, therefore they do not know exactly how much water is consumed, what the losses are etc. In some areas, potable water is used for irrigation purpose. In most cases UWSCG does not have treatment plants in place, so the only treatment may be chlorination. By law they apply 27% of additional non-revenue water fee to their tariffs that is covered by the government, although non-revenue losses are much higher than this.
<i>European Union Delegation to Georgia</i>	Alvaro Ortega Aparicio - Programme Manager of the European Union Delegation to Georgia	June 15, 2015	12.00pm	The office deal with regional projects only and the Project Manager is based in Brussels. The EU Water Initiative has 2 components: policy support and implementation (EPIRP, through Human Dynamics). In the future, the EU will continue with the Water Initiative and is planning to have a specific focus on Georgia with a dedicated country program. The plan is to integrate policy support with pilot projects, in order to integrate the Water Management Plan concept with River Basin Plans. Beside the approval, that has been taking several years, the implementation and enforcement of the water law is seen as a challenge due to the lack of strong political leadership. For this reason the office in Tbilisi focused mostly on Environmental Governance and Waste Management, both sectors where the GoG is quite responsive, while neglecting the Water

				and Forest programs. The recommendation is to work locally and try to find solutions for sustainability of the Water Component of the G4G project that will not require institutional participation or support: keep it local and bring training and knowledge first.
<i>Asian Development Bank</i>	Kathie M. Julian (Country Director) + Irakli Chkonia (Senior Project Officer)	June 15, 2015	4.00pm	<p>The support to the UWSCG includes 7 secondary towns and the scope of the work includes: intakes, Water Supply and Sanitation, Sewage networks and Treatment Plants (for both potable water and discharge). It also includes support for management and regulatory tariff setting. Government seems to be uncomfortable with dealing with a regulatory independent institution, to the point that for many years their office was transferred to a remote location. Resources allocated are not sufficient and most part of the staff do not speaks English, making more difficult for donors to support them. Nevertheless the importance of cost recovery seems to be now acknowledged, as well as the reliability of the service to be provided 24/7.</p> <p>The government wants to create a one-stop-shop for spatial information, but the coordination among different actors is very difficult. At the moment the Public Registry under the Ministry of Justice is hosting the initiative, supported by the Norwegian government. The ADB also finances HPPs together with EBRD and the IFC: they require thorough Environmental Impact Assessment EIA in order to authorize the loans.</p>

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